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Leafhoppers (Hemiptera: Cicadellidae) associated with the renosterbos, *Elytropappus rhinocerotis* Less. II. The genera *Cerus* Theron and *Refrolix* gen. nov.

by

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Ten new species of *Cerus* are described, viz. *C. ruficollis, C. goudanus, C. vensterus, C. breedensis, C. nieuwoudtus, C. lycaus, C. ladius, C. holgatae, C. avonturensis* and *C. piketensis*. These species are usually restricted to certain geographical regions, but some are sympatric. Two new species of *Refrolix* gen. nov. are described, viz. *R. ruensis* and *R. tralangensis*. The biogeography of the species of the two genera is discussed.

Cerus Theron, 1975

Ground colour stramineous, with crown, pronotum and tegmina showing fairly uniform pattern of brown to fuscous marks in all species. Head wider than pronotum (Fig. 6). Crown triangularly produced, but rounded to face; discal region smooth, frontal region shagreened. Coronal suture long, distinct. Each ocellus separated from adjacent eye by 5 to 6 × its diameter. Anteclypeus broadening apically and gena notched below eye (Fig. 5). Frontoclypeus with fuscous horizontal arcs. Ocellocular region about 6 × wider than gena below lorum. Antennae long.

Lateral margins of pronotum very short. Tegmina with 2 closed anteapical cells and no appendix (Fig. 4). Spinulation of fore tibiae 1 + 4 and hind femoral setal formula 2 + 2 + 1. Pygofer middorsally invaded for more than half its length (sometimes even to base) by articular membrane of anal tube. Tenth tergite strongly sclerotized. Each pygofer lobe posterodorsally with cluster of macrosetae (only alveoli shown in figures) and internally with large, strongly sclerotized, pointed process arising from dorsal rim of lobe. Plates separate and hind margin varying from truncate to pointed behind; posteriorly with irregularly arranged submarginal macrosetae. Valve triangular. Aedeagus symmetrical but showing great interspecific variation; gonopore apical, on dorsal or ventral side. Connective with short stem articulating with socle; basal arms well separated. Styles with straight apophyses.

Type-species: *Deltocephalus granarius* Naudé, 1926

Key to species of *Cerus*

1 Socle of aedeagus with pair of processes (Figs 63, 66) .... **piketensis** sp. nov.
— Socle without processes 2

2 Aedeagus without distinct socle (Fig. 11) .... **goudanus** sp. nov.
Aedeagus with distinct socle 3
3 Socle of aedeagus with well developed dorsal apodeme which is only slightly shorter than shaft (Figs 1, 16, 23) 4
Shaft of aedeagus much longer than dorsal apodeme of socle 6
4 Aedeagal shaft with pair of curved appendages (Figs 22, 23) .... **vensterus** sp. nov.
Aedeagal shaft without curved appendages 5
5 Aedeagal shaft broad in lateral view and ventrally with preapical tooth (Fig. 16) .... **ruficollis** sp. nov.
Aedeagal shaft narrow in lateral view and without preapical tooth (Fig. 1) .... **granarius** (Naudé)
6 Aedeagal shaft apically with two teeth as well as pair of appendages (Figs 39, 40) .... **lycaus** sp. nov.
Aedeagal shaft apically only with pair of appendages 7
7 Aedeagal shaft distinctly falcate 8
Aedeagal shaft short, not falcate (Figs 51, 52) .... **holgatae** sp. nov.
8 Pygofer invaded dorsally for more than $^2/_3$ of its length by articular membrane of anal tube (Fig. 34); aedeagus as in Figs 32 and 33 .... **nieuwoudtus** sp. nov.
Pygofer invaded dorsally for $^2/_3$ (or less) of its length by articular membrane of anal tube .. 9
9 Aedeagal shaft long (Figs 28, 29) .... **breedensis** sp. nov.
Aedeagal shaft shorter 10
10 Apical appendages of aedeagal shaft long (Figs 45, 46) .... **ladius** sp. nov.
Apical appendages of aedeagal shaft short (Figs 56, 57) .... **avonturensis** sp. nov.

Cerus granarius (Naudé), Figs 1–3

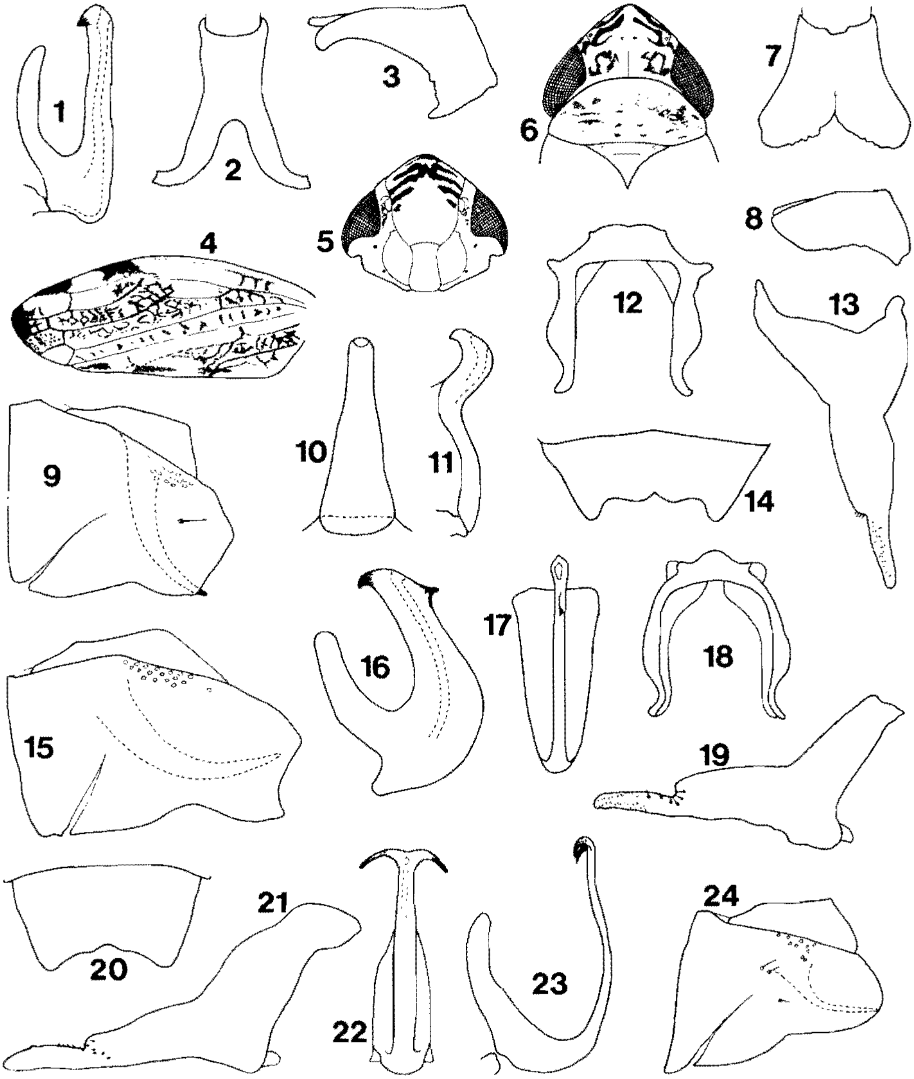
Deltocephalus granarius Naudé, 1926: 45
Cerus granarius (Naudé); Theron 1975: 193

When this species was redescribed some time ago (Theron 1975), only Naudé's faded type specimens were available, but in the present study many additional specimens from the Ceres district and Cedarberg region (Clanwilliam) were examined. In the Cedarberg males the shaft of the aedeagus is more slender in lateral view (Fig. 1) and the anterior margin of the tenth tergite bifurcates more strongly (Figs 2 & 3) than in Naudé's type-specimens from Ceres.

Cerus ruficollis sp. nov., Figs 15–20

MALE. Length from apex of crown to tips of tegmina 3,84–4,28 mm; transocular width 1,28–1,44 mm; greatest width of pronotum 1,20–1,32 mm. Tenth tergite long, as in *C. granarius*, and hind part also forming complete, sclerotized tube. Pygofer elongate and articular membrane of anal tube extending middorsally almost to its base. Pygofer process curved and directed posteriorly. Each pygofer lobe posteroventrally with lobe-like extension (Fig. 15). Plates slightly pointed behind and not extending beyond hind margin of pygofer lobes. Aedeagus with short, laterally compressed shaft, which is broad in lateral view and only slightly longer than socle; shaft dorsally with apical tooth and ventrally with subapical tooth (Figs 16, 17); gonopore on ventral side, near apex. Connective short, broad (Fig. 18). Styles as in Fig. 19.

FEMALE. Length 3,80–4,16 mm; transocular width 1,40–1,44 mm; greatest width of pronotum 1,24–1,32 mm. Seventh abdominal sternite as in Fig. 20.



Figs 1–24. *Cerus* spp. 1–3. *C. granarius* (Naudé) ♂ from Cederberg. 1. aedeagus, lateral view. 2 & 3. Tenth tergite, dorsal and lateral views. 4–14. *C. goudanus* sp. nov. 4–13. Holotype ♂. 4. Tegmen. 5. Face. 6. Head and thorax, dorsal view. 7 & 8. Tenth tergite, dorsal and lateral views. 9. Pygofer, lateral view. 10 & 11. Aedeagus, ventral and lateral views. 12. Connective. 13. Style. 14. Seventh abdominal sternite of ♂. 15–20. *C. ruficollis* sp. nov. 15–19. Holotype ♂. 15. Pygofer, lateral view. 16 & 17. Aedeagus, lateral and ventral views. 18. Connective. 19. Style. 20. Seventh abdominal sternite of ♀. 21–24. *C. vensterus* sp. nov., holotype ♂. 21. Style. 22 & 23. Aedeagus, ventral and lateral views. 24. Pygofer, lateral view.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: W. Rooihoogte Pass, Montagu, 18.i.1982, J. G. Theron. Paratypes: 3 ♂ 3 ♀, same data as holotype; 1 ♂ 2 ♀, Rooiberg Pass, Calitzdorp, 24.i.1983, J. G. Theron; 2 ♂ 10 km S.W. Ladismith, 19.i.1982, J. G. Theron; 2 ♂, Matjesfontein, 1–31.xii.1928, R. E. Turner.

REMARKS. This species is close to *C. granarius*, but can be recognized by the expanded aedeagal shaft. It has a wide distribution.

Cerus goudanus sp. nov., Figs 4–14

MALE. Length from apex of crown to tips of tegmina 3,92–4,20 mm; transocular width 1,39–1,50 mm; greatest width of pronotum 1,28–1,40 mm. Posterior part of 10th tergite not greatly expanded (Fig. 8) and not forming complete sclerotized tube; bifurcation of anterior region not very pronounced (Fig. 7). Pygofer middorsally invaded to near its base by articular membrane of anal tube. Pygofer lobes truncate behind (Fig. 9). Plates pointed behind and extending well beyond hind margins of pygofer lobes. Aedeagus small, simple, with very short curved shaft; socle undifferentiated (Figs 10, 11); gonopore on ventral side near apex. Connective large, angular (Fig. 12). Styles as in Fig. 13.

FEMALE. Length 3,72–4,04 mm; transocular width 1,40–1,48 mm; greatest width of pronotum 1,28–1,36 mm. Seventh abdominal sternite as in Fig. 14.

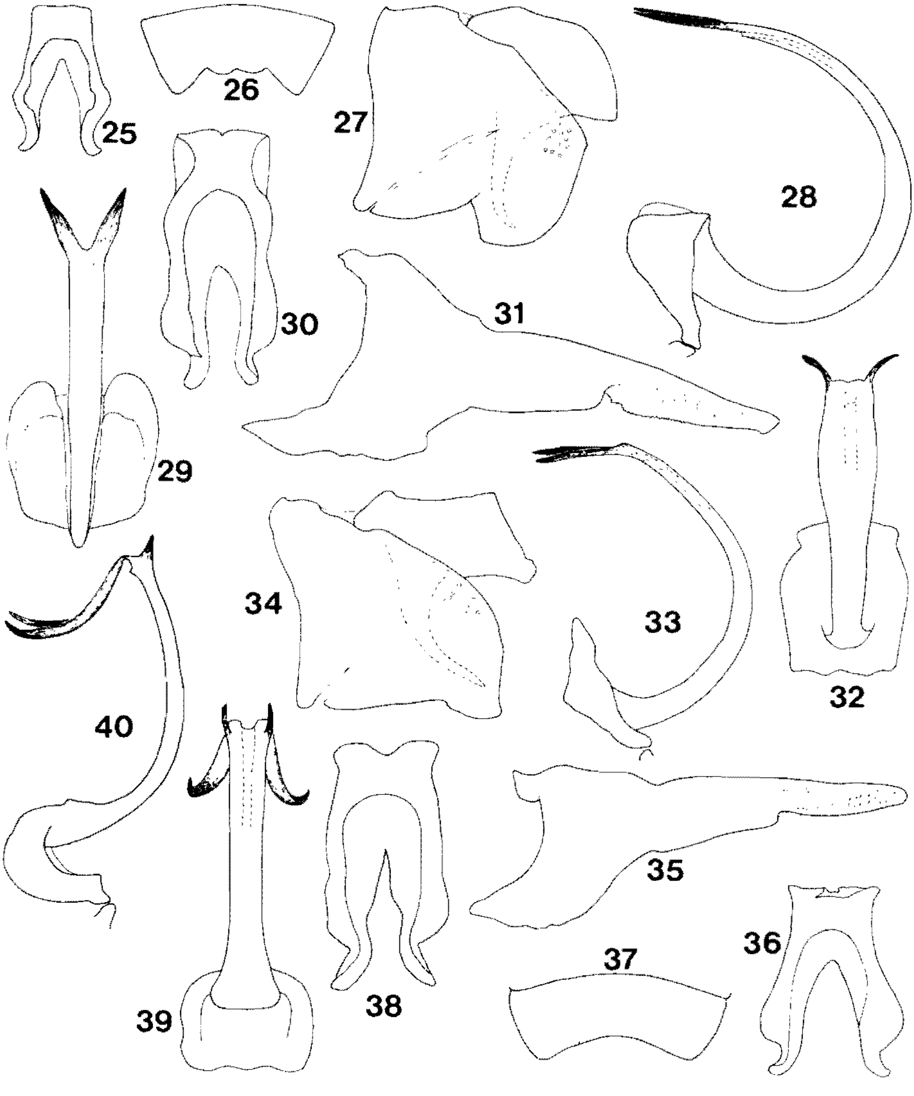
MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Gouda, 26.x.1971, J. G. Theron. Paratypes: 1 ♂, same data as holotype; 1 ♂, Koelenhof-Klapmuts region, xi.1974, J. G. Theron; 12 ♂ 5 ♀, Cedarberg, Clanwilliam, 21.xii.1976, J. G. Theron; 2 ♂ 2 ♀, La Plaisante, Wolseley, 2.xii.1981, J. G. Theron; 5 ♂ 7 ♀, Versfeld Pass, Piketberg, 17.xii.1981, G. Höppner; 3 ♂ 3 ♀, near Mamre, 18.xii.1981, J. G. Theron; 1 ♂ 2 ♀, Darling, 18.xii.1981, J. G. Theron; 1 ♂ 4 ♀, Voëlvlei, Tulbagh, 17.xii.1981, G. Höppner.

REMARKS. This species is sympatric with *C. granarius* in the Cedarberg region and here also occurs on *Elytropappus gnaphaloides* Levyns. In the Versfeld Pass it is sympatric with *C. piketensis* and at La Plaisante with *C. breedensis*.

Cerus vensterus sp. nov., Figs 21–26

MALE. Length from apex of crown to tips of tegmina 3,92–4,04 mm; transocular width 1,34–1,40 mm; greatest width of pronotum 1,24–1,29 mm. Tenth tergite as in *C. goudanus*, but not bifurcating anteriorly. Pygofer small and lobes rounded behind; pygofer processes curved and directed posteriorly (Fig. 24). Articular membrane of anal tube extending middorsally to near base of pygofer. Plates rounded, almost truncate behind and not extending posteriorly beyond hind margins of pygofer lobes. Aedeagus small, with slender elongate shaft terminating in pair of short curved processes (Figs 22, 23); gonopore on ventral side near apex. Connective as in Fig. 25. Styles as in Fig. 21.

FEMALE. Length 3,80 mm; transocular width 1,32–1,36 mm; greatest width of pronotum 1,16–1,24 mm. Seventh abdominal sternite as in Fig. 26.



Figs 25–40. *Cerus* spp. 25–26. *C. vensterus* sp. nov. 25. Connective of holotype. 26. Seventh abdominal sternite of ♀. 27–31. *C. breedensis* spec. nov., holotype ♂. 27. Pygofer, lateral view. 28 & 29. Aedeagus, lateral and ventral views. 30. Connective. 31. Style. 32–37. *C. nieuwoudtus* sp. nov. 32–36. Holotype ♂. 32 & 33. Aedeagus, ventral and lateral views. 34. Pygofer, lateral view. 35. Style. 36. Connective. 37. Seventh abdominal sternite of ♀. 38–40. *C. lycaus* sp. nov., holotype ♂. 38. Connective. 39 & 40. Aedeagus, ventral and lateral views.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Bokrivier, Ceres, 18.i.1982, J. G. Theron. Paratypes: 2 ♂ 1 ♀, same data as holotype; 2 ♂ 1 ♀ Matroosberg Station, 18.i.1982, J. G. Theron.

Cerus breedensis sp. nov., Figs 27–31

MALE. Length from apex of crown to tips of tegmina 4,12–4,32 mm; transocular width 1,52–1,60 mm; greatest width of pronotum 1,40–1,51 mm. Tenth tergite resembling that of *C. goudanus*, but narrower. Pygofer invaded middorsally for about ⅔ its length by articular membrane of anal tube (Fig. 27). Pygofer process relatively short, straight and directed ventrally. Plates as in *C. goudanus*. Aedeagus with flattened socle and long falcate shaft arising from shallow invagination in latter (Figs 28, 29); basal half of shaft compressed, distal half depressed and bearing pair of appendages at apex; gonopore dorsally between appendages. Connective as in Fig. 30 and styles as in Fig. 31.

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: La Plaisante, Wolseley, 2.xii.1981, J. G. Theron. Paratypes: 1 ♂, same data as holotype; 3 ♂, Romansrivier Station, 2.xii.1981, J. G. Theron; 6 ♂, Botha Station, 2.xii.1981, J. G. Theron; 3 ♂, Breërivier Station, 18.i.1982, J. G. Theron.

REMARKS. This species is sympatric with *C. goudanus* in the Wolseley region.

Cerus nieuwoudtus sp. nov., Figs 32–37

MALE. Length from apex of crown to tips of tegmina 4,12–4,36 mm; transocular width 1,40–1,50 mm; greatest width of pronotum 1,32–1,38 mm. Tenth tergite as in *C. goudanus*, but narrower. Pygofer deeply invaded middorsally by articular membrane of anal tube. Pygofer lobes slightly produced posteroventrally and pygofer processes also directed posteroventrally (Fig. 34). Plates as in *C. goudanus*. Aedeagus with broad flattened socle from which long, dorsoventrally flattened, falcate shaft arises (Figs 32, 33); shaft apically with paired appendages; small gonopore apically on dorsal side. Connective as in Fig. 36. Styles as in Fig. 35.

FEMALE. Length 4,24–4,32 mm; transocular width 1,44–1,48 mm; greatest width of pronotum 1,34–1,36 mm. Seventh abdominal sternite as in Fig. 37.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Nieuwoudtville, 1.ii.1978, J. G. Theron. Paratypes: 1 ♂ 2 ♀, same data as holotype.

Cerus lycaus sp. nov., Figs 38–42

MALE. Length from apex of crown to tips of tegmina 4,28–4,52 mm; transocular width 1,48–1,56 mm; greatest width of pronotum 1,36–1,48 mm. Tenth tergite distinctly bifurcating anteriorly, but otherwise as in *C. goudanus*. Pygofer process long and directed ventrally in holotype (Fig. 41), shorter in paratype. Pygofer invaded middorsally for about ⅔ its length by articular membrane of anal tube. Plates as in *C. goudanus*. Aedeagus with small socle and shaft apically with pair of short teeth and pair of long curved appendages (Figs 39, 40); gonopore at apex. Connective as in Fig. 38. Styles as in Fig. 42.

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Wildehond Pass, Montagu, 18.i.1982, J. G. Theron. Paratype: 1 ♂, Montagu, 18.i.1982, J. G. Theron.

Cerus ladius sp. nov., Figs 43–48

MALE. Length from apex of crown to tips of tegmina 4,24–4,60 mm; transocular width 1,48–1,60 mm; greatest width of pronotum 1,36–1,46 mm. Tenth tergite as in *C. goudanus*. Pygofer invaded middorsally for ⅔ its length by articular membrane of anal tube (Fig. 43). Plates as in *C. goudanus*. Pygofer process usually long, stout and straight (as in holotype), but sometimes shorter, curved. Shaft of aedeagus relatively short, with pair of long apical appendages (Figs 45, 46); gonopore apical. Connective as in Fig. 44. Styles large (Fig. 47).

FEMALE. Length 4,28–4,32 mm; transocular width 1,52 mm; greatest width of pronotum 1,36–1,40 mm. Seventh abdominal sternite as in fig. 48.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: 5 km E. Ladismith, 19.i.1982, J. G. Theron. Paratypes: 2 ♂, same data as holotype; 1 ♂, 3 km W. Huisrivier Pass, Ladismith, 19.i.1982, J. G. Theron; 1 ♂, Burgers Pass, Montagu, 18.i.1982, J. G. Theron; 1 ♂ 2 ♀, Barrydale, 19.i.1982, J. G. Theron.

Cerus holgatae sp. nov., Figs 49–54

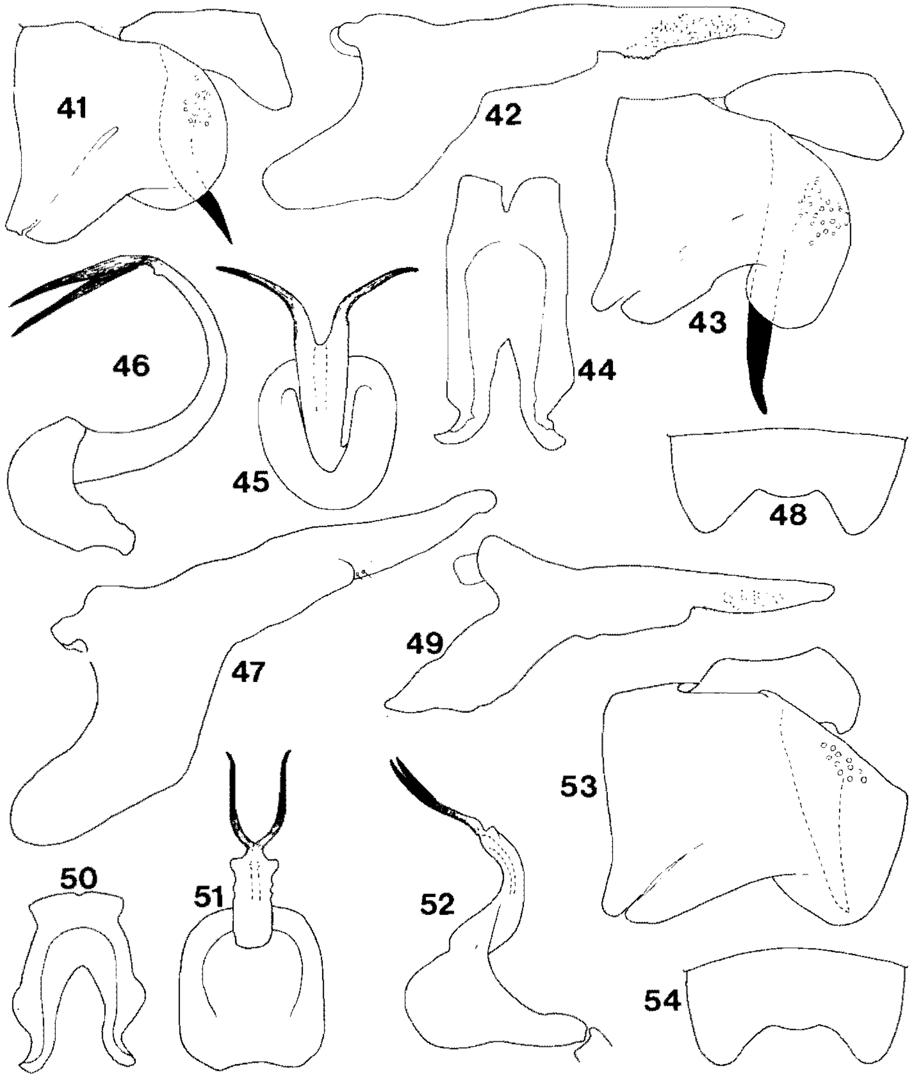
Male. Length from apex of crown to tips of tegmina 4,08–4,40 mm; transocular width 1,44–1,52 mm; greatest width of pronotum 1,35–1,42 mm. Tenth tergite as in *C. goudanus*. Pygofer invaded middorsally for about ⅔ its length by articular membrane of anal tube (Fig. 53). Hind margin of pygofer lobes strongly sclerotized and bent inwards; pygofer process stout. Plates as in *C. goudanus*. Aedeagus with almost quadrangular socle, with deep ventral invagination, from which short curved shaft arises (Figs 51, 52); shaft apically with pair of vertical (sometimes horizontal) appendages and gonopore on dorsal side. Connective as in Fig. 50. Styles as in Fig. 49.

FEMALE. Length 4,04–4,18 mm; transocular width 1,46–1,48 mm; greatest width of pronotum 1,32–1,36 mm. Seventh abdominal sternite as in Fig. 54.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Holgate, Oudtshoorn, 30.i.1980, J. G. Theron. Paratypes: 8 ♂ 2 ♀, same data as holotype; 3 ♂ 10 ♀, same data but date 20.i.1982; 4 ♂ 3 ♀, Cango and Kruisrivier, 19.i.1982, J. G. Theron; 1 ♂, 2 km W. Oudtshoorn, 20.i.1982, J. G. Theron; 4 ♂ 4 ♀, near Robinson Pass, Oudtshoorn, 22.xii.1982, J. G. Theron; 3 ♂ 1 ♀, Schoonberg, Camfer, 20.i.1982, J. G. Theron.

Cerus avonturensis sp. nov., Figs 55–60

MALE. Length from apex of crown to tips of tegmina 4,36–4,60 mm; transocular width 1,52–1,58 mm; greatest width of pronotum 1,40–1,44 mm. Tenth tergite as in



Figs 41–54. *Cerus* spp. 41–42. *C. lycaus* sp. nov. holotype ♂. 41. Pygofer, lateral view. 42. Style. 43–48. *C. ladius* sp. nov. 43–47. Holotype ♂. 43. Pygofer, lateral view. 44. Connective. 45 & 46. Aedeagus, ventral and lateral views. 47. Style. 48. Seventh abdominal sternite of ♀. 49–54. *C. holgatae* sp. nov. 49–53. Holotype ♂. 49. Style. 50. Connective. 51 & 52. Aedeagus, ventral and lateral views. 53. Pygofer, lateral view. 54. Seventh abdominal sternite of ♀.

C. goudanus but narrower. Pygofer invaded for about ⅔ its length by articular membrane of anal tube (Fig. 55). Plates as in *C. goudanus*. Pygofer process long. Socle of aedeagus with deep ventral invagination, from which anteriorly curving shaft arises (Figs 56, 57); shaft apically with pair of short appendages and gonopore on dorsal side. Connective as in Fig. 59. Styles as in Fig. 58.

FEMALE. Length 4,28–4,52 mm; transocular width 1,52–1,56 mm; greatest width of pronotum 1,38–1,44 mm. Seventh abdominal sternite broadly incised behind (Fig. 60).

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Avontuur, 2.ii.1977, J. G. Theron. Paratypes: 1 ♀, same data as holotype; 2 ♂ 3 ♀, Avontuur, 20.i.1982, J. G. Theron; 1 ♂, Misgund, 20.i.1982, J. G. Theron.

REMARKS. *Cerus* specimens collected at Willowmore are close to *C. avonturensis*, but the aedeagus is shorter and straighter; their specific status is at present uncertain.

Cerus piketensis sp. nov., Figs 61–67

MALE. Length from apex of crown to tips of tegmina 3,60–4,28 mm; transocular width 1,32–1,50 mm; greatest width of pronotum 1,20–1,36 mm. Tenth tergite as in *C. goudanus* but shorter. Pygofer invaded for ¾ its length by articular membrane of anal tube (Fig. 61). Pygofer processes straight, pointing ventrally and situated close to hind margin of pygofer lobes. Plates rounded behind and extending posteriorly beyond hind margin of pygofer lobes. Aedeagus with pair of long appendages arising from socle and shorter appendages arising from shaft (Figs 62, 63); gonopore ventral, near apex. Shape of aedeagus somewhat variable; shaft slender in lateral view in specimens from Piketberg (Fig. 62), Pikenierskloof and Halfmanshof, but broad in specimens from Mamre, Tulbagh, Klapmuts and Moorreesburg (Fig. 66). Styles with short apophyses (Fig. 64). Connective as in Fig. 65.

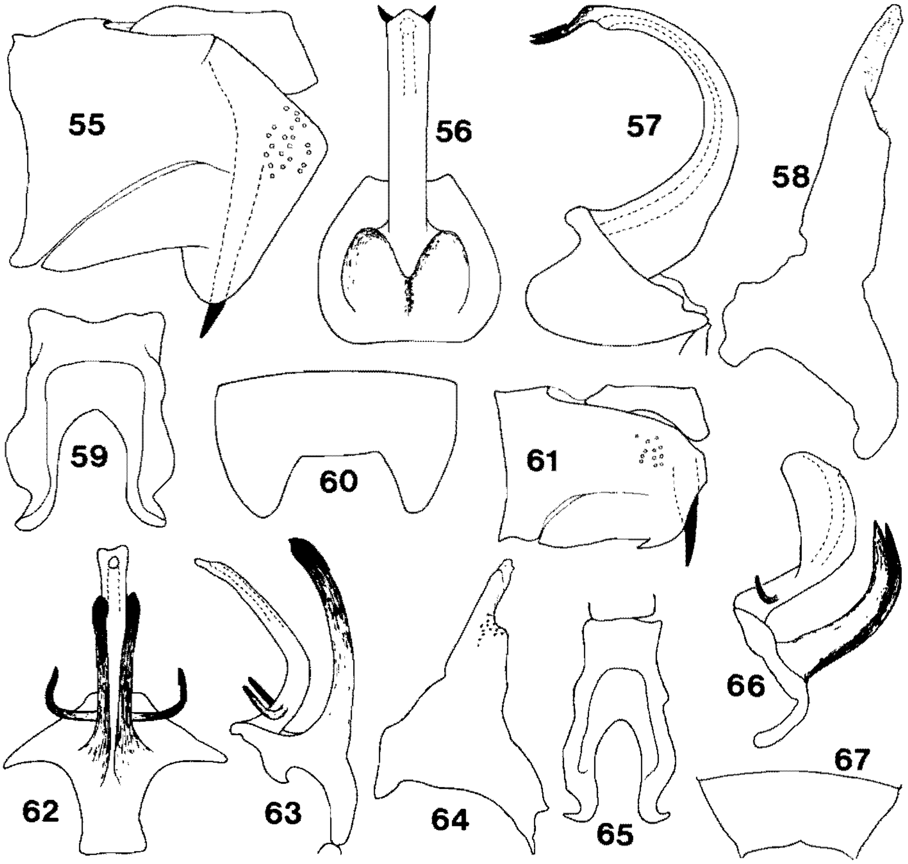
FEMALE. Length 3,80–4,08 mm; transocular width 1,36–1,48 mm; greatest width of pronotum 1,24–1,36 mm. Seventh abdominal sternite as in Fig. 67.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Piketberg 17.xii.1981, J. G. Theron. Paratypes: 2 ♂, Versfeld Pass, Piketberg, 17.xii.1981, G. Höppner; 7 ♂ 11 ♀, Pikenierskloof, 19.i.1983, J. G. Theron; 4 ♂ 5 ♀, Halfmanshof, 17.xii.1981 and 9.ii.1983, J. G. Theron; 3 ♂ 7 ♀, Moorreesburg, 9.ii.1983, J. G. Theron; 3 ♂ 1 ♀, Grootvlei, Tulbagh, 17.xii.1981, J. G. Theron; 3 ♂ 3 ♀, Klapmuts, 17.xii.1981, J. G. Theron; 1 ♂, near Mamre, 18.xii.1981, J. G. Theron.

REMARKS. This species is sympatric with *C. goudanus* in the Piketberg and Darling regions.

DISCUSSION

The simple structure of the aedeagus in *C. goudanus*, *C. granarius* and *C. ruficollis* suggests that these species are closely related; likewise the falcate aedeagus of *C. vensterus*, *C. breedensis*, *C. nieuwoudtus*, *C. lycaus*, *C. holgatae* and *C. avonturensis* may indi-



Figs 55–67. *Cerus* spp. 55–60. *C. avonturensis* sp. nov. 55–59. Holotype ♂. 55. Pygofer, lateral view. 56 & 57. Aedeagus, ventral and lateral views. 58. Style. 59. Connective. 60. Seventh abdominal sternite of ♀. 61–67. *C. piketensis* sp. nov. 61–66. Holotype ♂. 61. Pygofer, lateral view. 62 & 63. Aedeagus, ventral and lateral views. 64. Style. 65. Connective. 66. Aedeagus of ♂ from Moorreesburg. 67. Seventh abdominal sternite of ♀.

cate affinity. The complexity of the aedeagus in *C. piketensis* isolates this species from the others and it is interesting to note that it occupies approximately the same geographical area as *Renosteria piquetia,* in which the aedeagus is also aberrant. The regional distribution of certain other species of *Renosteria* and *Cerus* also coincides to some extent, e.g. *R. spadix* and *C. granarius*, *R. waverena* and *C. goudanus, R. karosella* and *C. holgatae, R. hoekoensis* and *C. ladius* and *R. hantamensis* and *C. nieuwoudtus*. Hitherto no specimens of *Cerus* have been collected in the coastal region from Villiersdorp to Mossel Bay, i.e. in the type-locality of *R. overbergia*.

Unlike *Renosteria* species, the species of *Cerus* are not all confined to *Elytropappus rhinocerotis: C. goudanus* occurs on the latter as well as on *E. gnaphaloides*. The distribution of the species of *Cerus* would therefore be influenced to a lesser degree by the distribution of the renosterbos than would *Renosteria*. Although *Cerus* species were consistently found in association with *Renosteria* species on the renosterbos, their population density is always much lower than in the latter and far fewer specimens were therefore collected; some species may even have remained undiscovered in the localities investigated. Imagines were only collected during the summer months and stylopized specimens were common.

As in *Renosteria,* no specimens of *Cerus* were collected in the Cape Peninsula and it was found that in the absence of these two genera the renosterbos at Signal Hill and Bakoven are invaded by the leafhopper *Caffrolix cyclopia* (Cogan), which is a common inhabitant of fynbos, but not of the renosterbos outside the Cape Peninsula.

Refrolix gen. nov.

Head wider than pronotum (Fig. 68). Crown triangularly produced in front but rounded to face; discal region smooth, shiny; frontal region and face shagreened. Coronal suture about half length of crown. Each ocellus separated from adjacent eye by about three times its diameter. Anteclypeus parallel-sided and gena notched below eye. Frontoclypeus with horizontal arcs (Fig. 69). Ocellocular region about twice width of gena below lorum. Antennae long.

Lateral margins of pronotum very short. Tegmina short, with venation indistinct and very variable; no appendix. Hind wings reduced, probably non-functional. Spinulation of fore tibiae 1 + 4; hind femoral setal formula 2 + 2 + 1. Pygofer middorsally invaded for nearly half its length by articular membrane of anal tube (Fig. 70). Tenth tergite broad, well sclerotized. Each pygofer lobe posterodorsally with macrosetae and some smaller setae, but no process. Plates triangular, with many irregularly arranged submarginal macrosetae ventrally along outer edges (Fig. 72). Valve broadly triangular. Aedeagus simple, symmetrical, with gonopore on ventral side (Fig. 74). Connective well sclerotized, Y-shaped, with narrow stem articulating with socle (Fig. 75). Styles narrow, elongate, with short apophyses (Figs 71, 77).

Type-species: *Refrolix ruensis* sp. nov.

This genus belongs to the tribe Athysanini and in its external features closely resembles *Caffrolix* Linnavuori. However, the tenth tergite is smaller and the genitalia also differ markedly, the aedeagus being small, simple, tubular and lacking the variety of teeth and processes which are so characteristic of all known *Caffrolix* species. The stem of the connective is also narrower and more strongly sclerotized than in *Caffrolix* and the apophyses of the styles are not denticulate.

Refrolix ruensis sp. nov., Figs 68–76

MALE. Length from apex of crown to tips of tegmina 3,00–3,72 mm; transocular width 1,22–1,36 mm; maximum width of pronotum 1,08–1,24 mm. Ground colour stramineous, with light to dark brown marks on crown, pronotum and tegmina (Fig. 68); frontoclypeus with about 10 brown horizontal arcs.

Pygofer lobes slightly notched behind (Fig. 70). Aedeagus with distinct socle; shaft tubular basally, but sharply pointed apically beyond large ventral gonopore (Figs 73, 74). Apophyses of styles pointed and curving outwards (Fig. 71). Plates and connective as in Figs 72 and 75.

FEMALE. Brachypterous. Length from apex of crown to tips of tegmina 3,16–3,60 mm, to tip of abdomen 3,32–3,72 mm. Hind margin of 7th abdominal sternite as in Fig. 76.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA. Villiersdorp, 28.x.1981, J. G. Theron. Paratypes: 10 ♂ 3 ♀, same data as holotype; 3 ♂ 1 ♀, Caledon, 12.i.1971 and 25.ix.1981, J. G. Theron; 3 ♂ 2 ♀, Bredasdorp, 9.xii.1977, J. G. Theron; 4 ♂ 2 ♀, Elim, 30.ix.1981, J. G. Theron; 4 ♂ 2 ♀, Struis Bay, 29.ix.1981, J. G. Theron; 3 ♂ 1 ♀, Botrivier, 8.xii.1977, J. G. Theron; 4 ♂ 1 ♀, Kleinmond, 23.xi.1977, J. G. Theron; 4 ♂ 2 ♀, Swellendam, 23.i.1982, J. G. Theron; 4 ♂ 1 ♀, Heidelberg, C.P., 31.i.1980, J. G. Theron; 5 ♂, Riversdale, 20.xii.1973, J. G. Theron; 4 ♂ 1 ♀, Albertinia, 23.i.1982, J. G. Theron; 5 ♂ 1 ♀, Mossel Bay, 28.i.1980 and 23.i.1982, J. G. Theron; 3 ♂ 1 ♀, Bonnievale, 1.iv.1973, J. G. Theron.

Refrolix tralangensis sp. nov., Figs 77–79

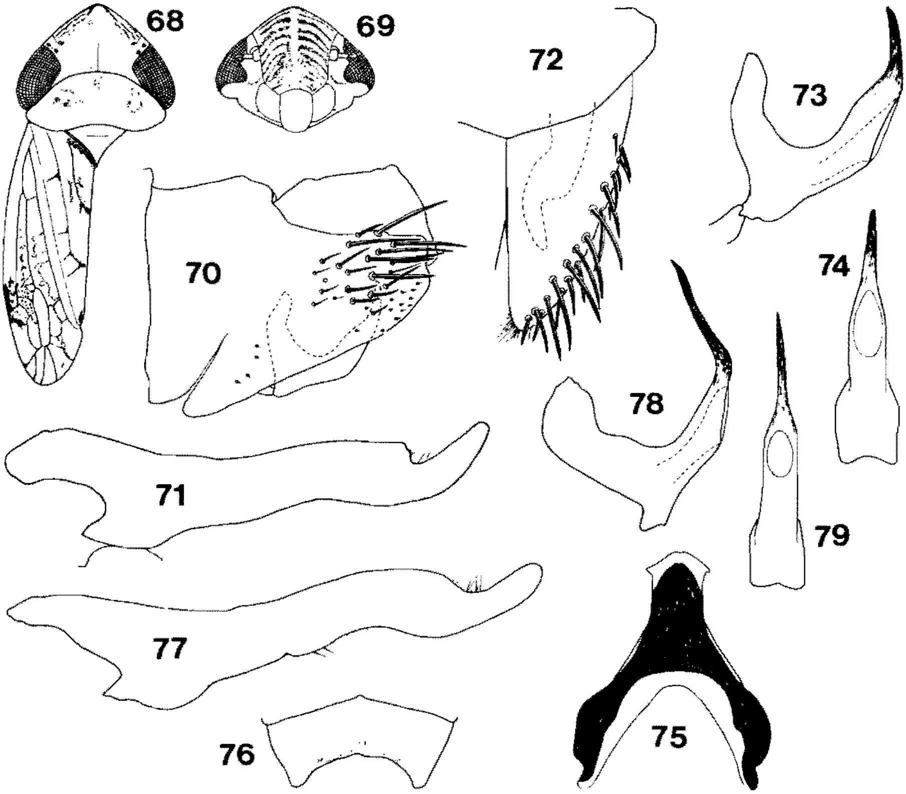
MALE. Length from apex of crown to tips of tegmina 2,96–3,92 mm; transocular width 1,15–1,45 mm; greatest width of pronotum 1,04–1,36 mm. Colouration as in *R. ruensis*.

Pygofer lobes, connective and plates as in *R. ruensis*. Shaft of aedeagus in lateral view more slender than in *R. ruensis* and acuminate apical part, which may be fairly straight or slightly recurved, about twice as long as in the latter (Figs 78, 79). Apophyses of styles fairly straight and almost parallel-sided (Fig. 77).

FEMALE. Brachypterous. Length from apex of crown to tips of tegmina 3,08–3,88 mm, to tip of abdomen 3,16–3,97 mm. Hind margin of 7th abdominal sternite as in *R. ruensis*.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Montagu, 18.i.1982, J. G. Theron. Paratypes: 9 ♂ 3 ♀, same data as holotype; 2 ♂, Scheepersrus, Montagu, 3.vii.1973, J. G. Theron; 3 ♂ 1 ♀, Barrydale, 3.vii.1973, J. G. Theron; 3 ♂ 1 ♀, Barrydale, 19.i.1982, J. G. Theron; 1 ♂, Theronsberg, Ceres, 16.xi.1976, J. G. Theron; 1 ♂ 1 ♀, Ladismith, 19.i.1982, J. G. Theron; 1 ♂, Huisrivier Pass, 3.vii.1973, J. G. Theron; 2 ♂ 1 ♀, Cango Caves, Oudtshoorn, 4.vii.1973, J. G. Theron; 3 ♂, Cango, Oudtshoorn, 19.i.1982, J. G. Theron; 2 ♂, Kruisrivier, Oudtshoorn, 19.i.1982, J. G. Theron; 3 ♂, near Robinson Pass, Oudtshoorn, 22.xii.1982, J. G. Theron; 1 ♂, Swartbergen, xi.1935; 2 ♂, Camfer, 20.i.1982, J. G. Theron; 6 ♂ 2 ♀, Avontuur, 2.ii.1977 and 20.i.1982, J. G. Theron; 4 ♂ 1 ♀, Misgund, 20.i.1982, J. G. Theron; 3 ♂ 1 ♀, Joubertina, 20.i.1982, J. G. Theron.

REMARKS. This species is close to *R. ruensis* but can be recognized by the shape of the aedeagus and styles. In specimens from Ladismith and the Huisrivier Pass the apophyses of the styles are rather longer than usual.



Figs 68–79. *Refrolix* spp. 68–76. *R. ruensis* sp. nov. 68–75. Holotype ♂. 68. Dorsal view. 69. Face. 70. Pygofer, lateral view. 71. Style. 72. Plate and part of valve. 73 & 74. Aedeagus, lateral and ventral views. 75. Connective. 76. Seventh abdominal sternite of ♀. 77–79. *R. tralangensis* sp. nov., holotype ♂. 77. Style. 78 & 79. Aedeagus, lateral and ventral views.

DISCUSSION

The genus *Refrolix* apparently has no representatives in the western part of the southern Cape region. Its two known species are allopatric, *R. ruensis* occurring south of the Langeberg range (from Villiersdorp to Mossel Bay) and *R. tralangensis* north of this range (from the Theronsberg Pass to Joubertina). Both species were thus far only collected on the renosterbos, *R. tralangensis* always in association with *Renosteria* and *Cerus*. Population densities are sometimes fairly high.

Compared with *Renosteria* and *Cerus*, the species diversity of *Refrolix* is small, *R. tralangensis* being the only species present in a large region where multiple physiographic barriers have induced the development of quite a number of species of *Renosteria* and *Cerus*. *Refrolix* may have a low propensity for speciation, or its invasion of the Renosterbos may be fairly recent, as is evinced by its apparent absence from the western part of the southern Cape region. It may also have additional host plants and its invasion of the renosterbos may be secondary.

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